

The Innovation Landscape @ NASA:

Promising Practices, Framework, and Sustainability

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Deputy Administrator

@DavaExplorer



Transformative

(New Org + Tech)

Disruptive

(New Organizational Model)

Revolutionary

(New Technological Competence)

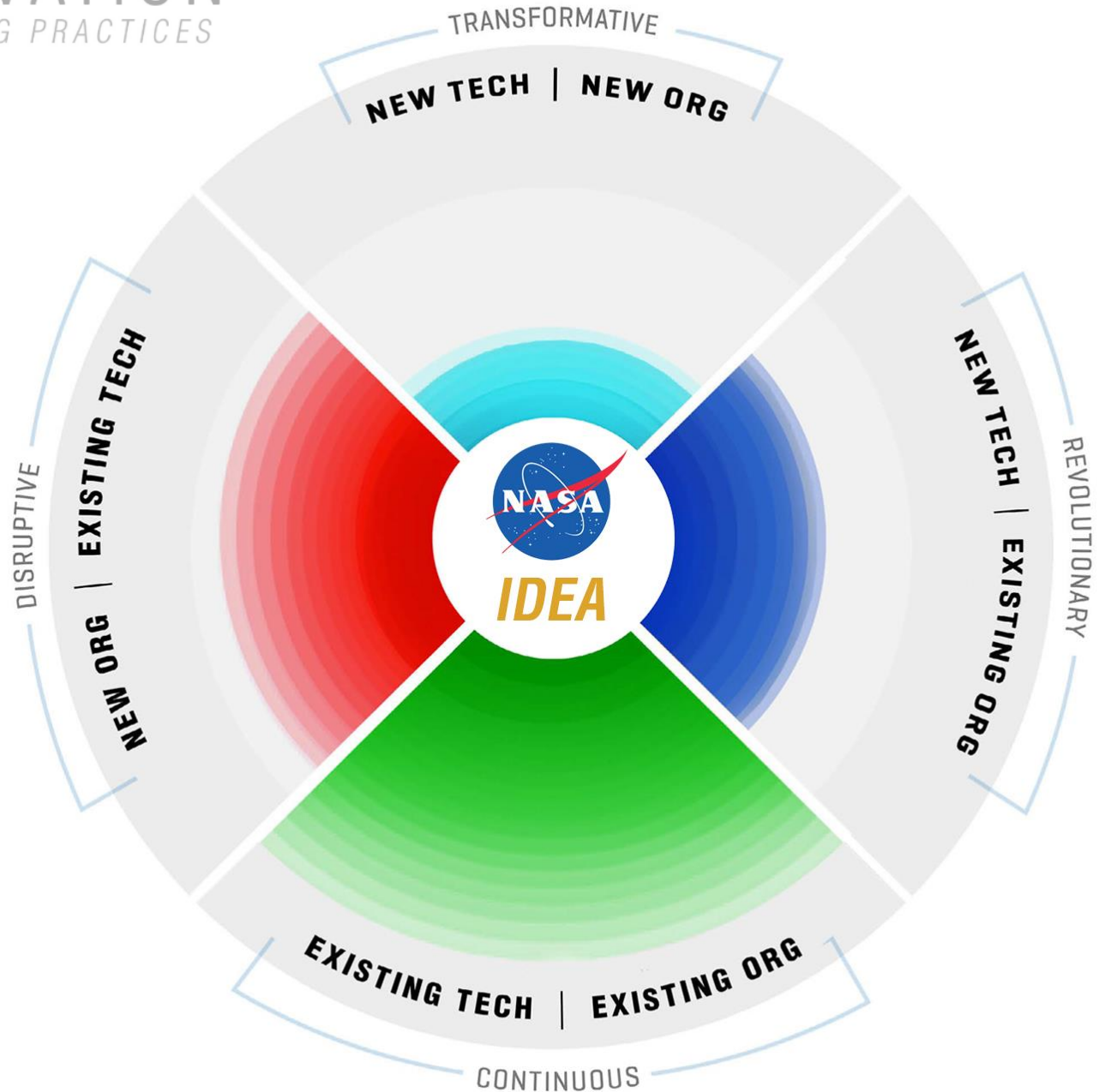
Continuous

(Existing Technology and
Organization)



INNOVATION

PROMISING PRACTICES

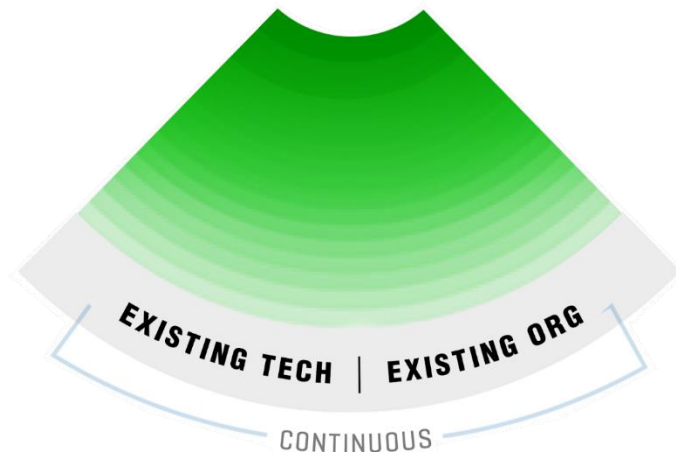




INNOVATION
PROMISING PRACTICES

EXISTING TECHNOLOGY
EXISTING ORGANIZATION

C O N T I N U O U S



EXAMPLES of
PROMISING
PRACTICES

Blue Sky Events

Center Innovation
Fund Program

Creativity &
Innovation Initiative

Digital Learning
Network

MissionSTEM

Early Career Initiative

Engineering Design
Studio

Ethics Based
Decision Framework

Digital Learning Networks

National Aeronautics and
Space Administration



#JOURNEYTOMARS



National Aeronautics
and Space Administration



+ ODEO Web Site
+ Contact Us
+ Site Map

FIND IT @ NASA :

+ GO

MissionSTEM

21st Century Civil Rights Technical Assistance for
Science, Technology, Engineering, and Mathematics

+ Home

+ About Mission STEM

+ MissionSTEM Summit 2016

+ Filing a Complaint

+ Compliance Requirements

+ Civil Rights Compliance Reports

+ Promising Practices (NASA)

+ Promising Practices (Colleges)

+ Promising Practices (Museums)

+ Diversity and Inclusion
Leadership

+ NASA Innovations Impact
the World

+ Unconscious Bias in STEM:
Addressing the Challenges

+ Related Links

+ Media Gallery



+ Age



+ Disability



+ Gender



+ Race/Ethnicity

What's New?

- + [MissionSTEM Summit 2016](#)
- + [Deputy Administrator's Blog on Harassment Policies](#)
- + [Chief Scientist's Blog on Data Collection](#)

Message
from the
Administrator
[+ Watch video](#)



Office of Diversity and Equal Opportunity

The MissionSTEM Web site is designed to assist NASA grant recipients with their civil rights compliance efforts. The Agency strives to provide a broad scope to its technical assistance in this arena.

[+ Read More](#)



Compliance Requirements
For NASA Grantees

MissionSTEM

21st Century Civil Rights Technical Assistance for
Science, Technology, Engineering, and Mathematics

- Home
- About Mission STEM
- Filing a Complaint
- Compliance Requirements
- Civil Rights Compliance Reports
- Promising Practices (MS-SEI)
- Promising Practices (Colleges)
- Promising Practices (Museums)
- Diversity and Inclusion Leadership
- MS-SEI Innovations Report for Youth
- Dissemination Case in STEM Addressing the Challenge
- Related Links
- Media Gallery
- Working Group
- FAQs

Office of Diversity and Equal Opportunity

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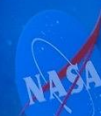
Compliance Requirements For Federal Grantees

Promising Practices For Colleges and Universities

Promising Practices For Science Centers and Museums



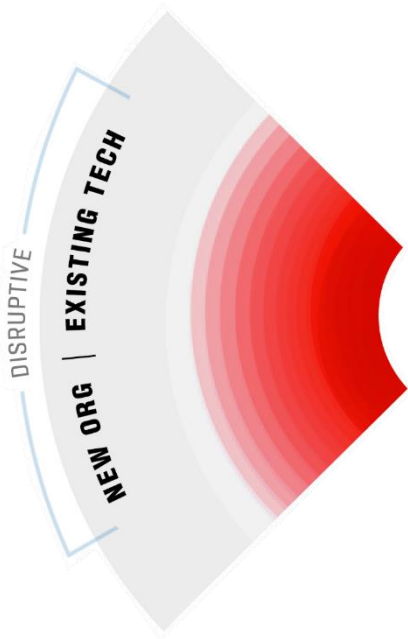
2016
MissionSTEM
Summit





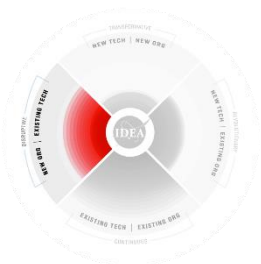
INNOVATION

PROMISING PRACTICES



**NEW ORGANIZATION
EXISTING TECHNOLOGY**

D I S R U P T I V E



EXAMPLES of PROMISING PRACTICES

Centennial Challenges

Center of Excellence for
Collaborative Innovation

Citizen Science and Open
Innovation

Commercial Crew
and Cargo Programs

Enterprise Cloud

Computing Services for
Engineering

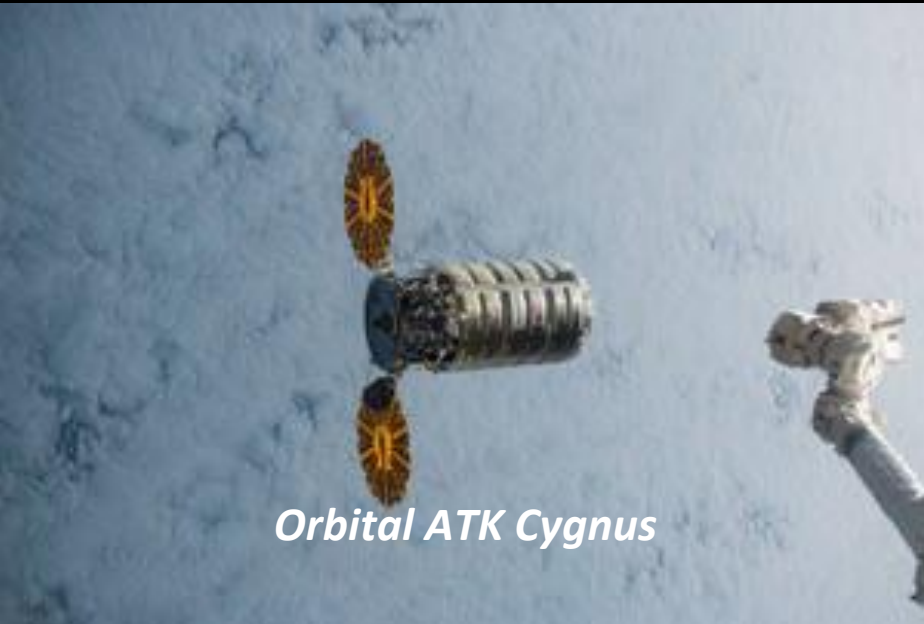
NASA@Work

NASA Shared Services
Center

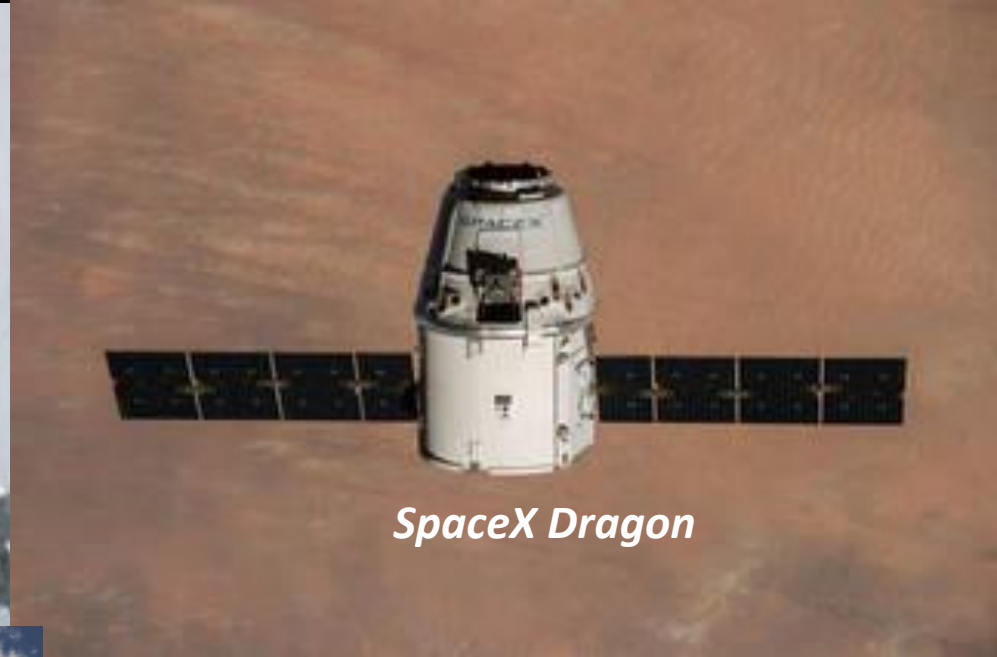
NextStep Broad Agency
Announcement

ISS Public-Private Partnerships

National Aeronautics and
Space Administration



Orbital ATK Cygnus



SpaceX Dragon



Russian Soyuz



JAXA HTV

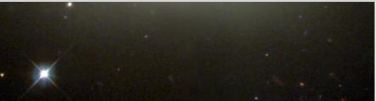
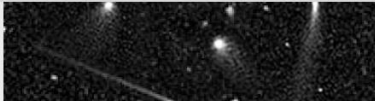
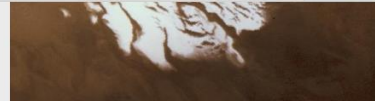

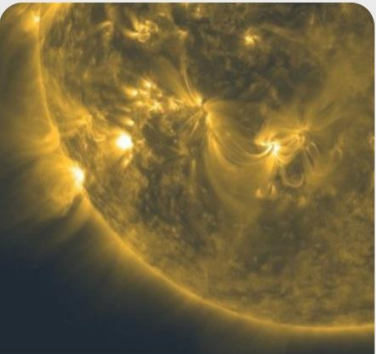






Citizen Science

National Aeronautics and
Space Administration



<https://www.diskdetective.org/#/classify>

Background - Google Drive Projects — Zooniverse Disk Detective

 <p>POPPIN' GALAXY</p>	 <p>COMET HUNTERS</p>	 <p>PLANET FOUR: TERRAINS</p>	 <p>SCIENCE GOSSIP</p>
 <p>SUNSPOTTER</p>	 <p>DISK DETECTIVE</p>	 <p>RADIO GALAXY ZOO</p>	 <p>PLANET FOUR</p>
 <p>PLANET HUNTERS</p>	 <p>GALAXY ZOO</p>		





INNOVATION

PROMISING PRACTICES

**NEW TECHNOLOGY
EXISTING ORGANIZATION**

REVOLUTIONARY



EXAMPLES of PROMISING PRACTICES

Blended Wing Body
Aircraft Design

Computational
Digital
Transformation

NASA's
Transformative
Aeronautics
Concepts Program

James Webb Space
Telescope

UAS Traffic
Management

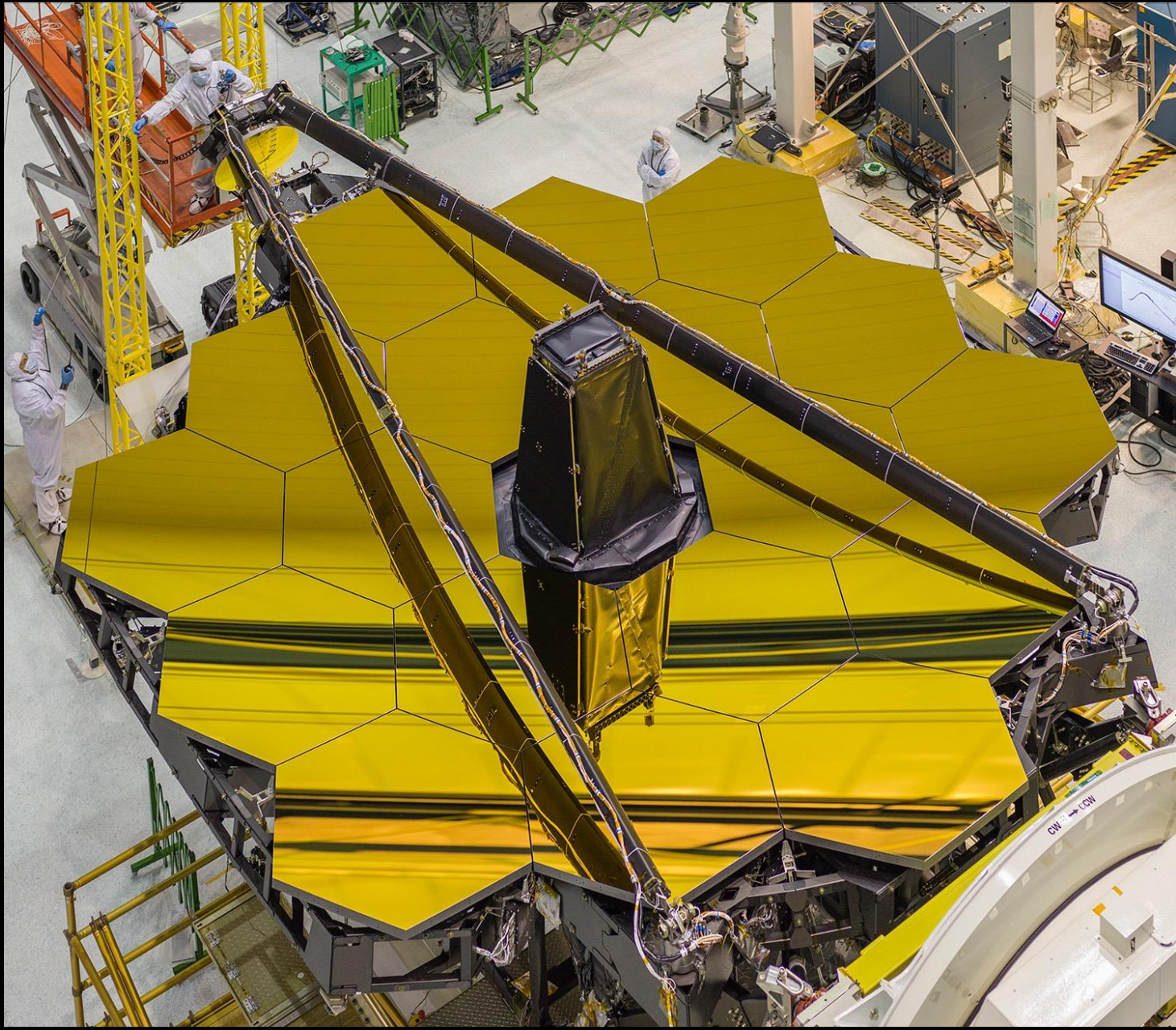
The Future of Flight

National Aeronautics and
Space Administration



James Webb Space Telescope

National Aeronautics and
Space Administration





INNOVATION

PROMISING PRACTICES



NEW TECHNOLOGY NEW ORGANIZATION

TRANSFORMATIVE



EXAMPLES of PROMISING PRACTICES

Building and Operating the
International Space Station

Studying Ocean Worlds and
Extrasolar Planets

Expanding human presence
in the solar system via
Journey to Mars

Learning whether life exists
in the solar system beyond
earth

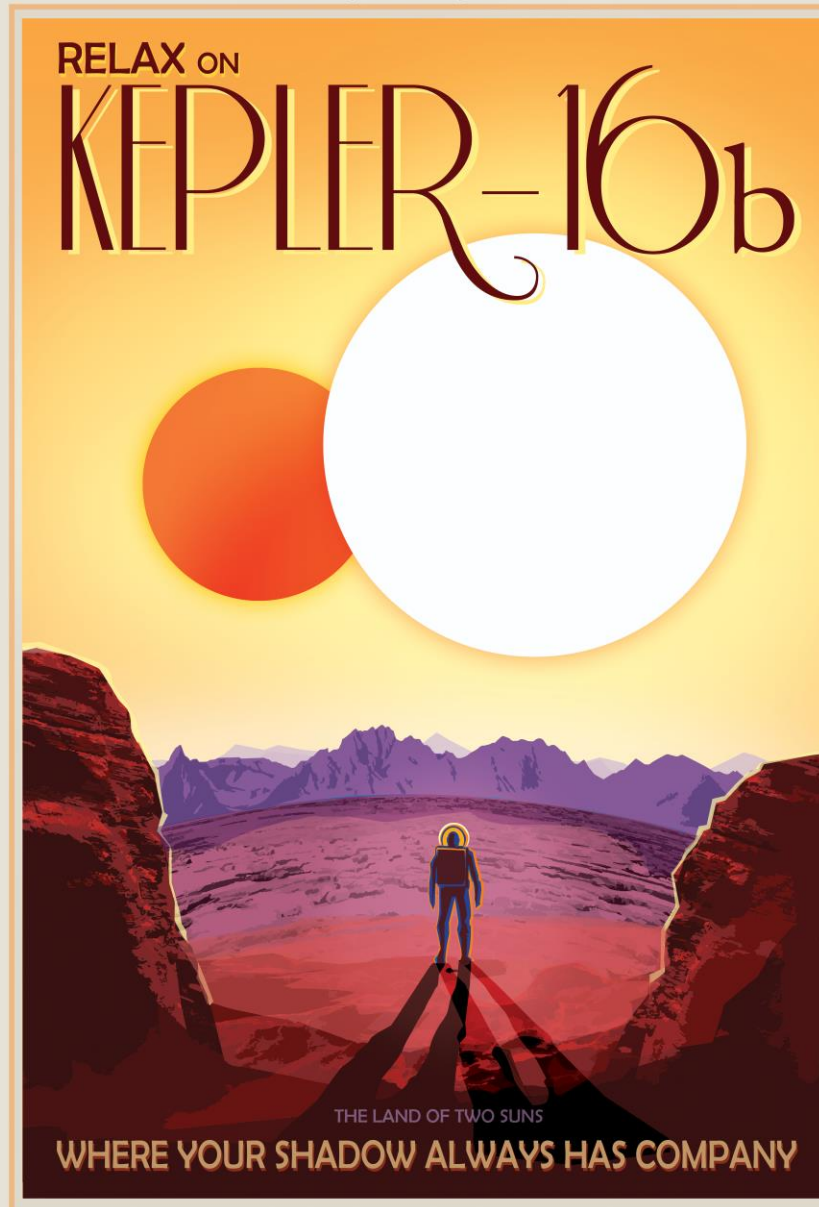
Enabling a transformation for
safe and sustainable U.S.
and global aviation

Understanding Global
Climate Change

Minimizing the Impact of
Space Debris

16 Years of Human Habitation on ISS





Like Luke Skywalker's planet "Tatooine" in *Star Wars*, Kepler-16b orbits a pair of stars. Depicted here as a terrestrial planet, Kepler-16b might also be a gas giant like Saturn. Prospects for life on this unusual world aren't good, as it has a temperature similar to that of dry ice. But the discovery indicates that the movie's iconic double-sunset is anything but science fiction.

NASA's Exoplanet Exploration Program, JPL Propulsion Laboratory, Pasadena CA
exep.jpl.nasa.gov

JOURNEY TO MARS



All elements needed for a human Mars mission are in development now.



EARTH RELIANT

NOW - MID-2020s

ISS & commercial development of LEO

Deep space systems life support and human health

PROVING GROUND

2018-2030

Crewed missions, spacewalks in cislunar space

Deep space habitation; Shakedown cruise(s) for Mars

Integrated human and robotic operations

EARTH INDEPENDENT

NOW – 2030s and beyond

Science missions pave the way to Mars;
Robotic roundtrip demonstration
with sample return in the late 2020s

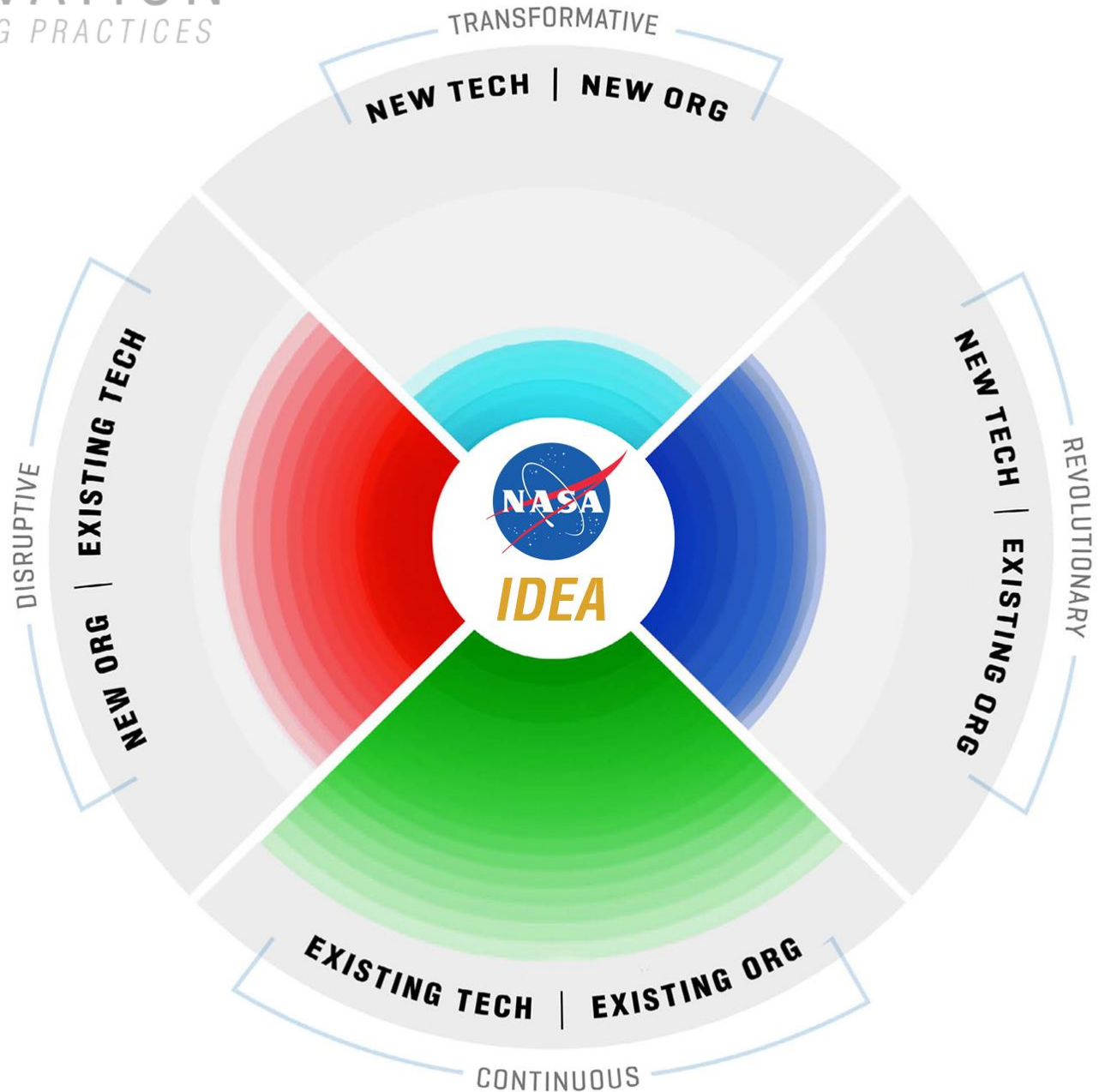
Entry, descent, and landing & in-situ resources

Send humans to orbit Mars in the early 2030s



INNOVATION

PROMISING PRACTICES



INNOVATION VISUAL HISTORY

BARRIERS TO INNOVATION

7 THEMES

- ☑ risk-averse culture
- ☑ lack of opportunity
- ☑ organizational inertia
- ☑ communication challenges
- ☑ short-term focus
- ☑ process overload
- ☑ instability

5 RECOMMENDATIONS

- ★ corporate time for creative thinking
- ★ innovation labs & creative spaces
- ★ process streamlining
- ★ innovation investments
- ★ skunkworks

AGENCY CULTURE STRATEGY

- ☑ Recognize + Reward Innovation
- ☑ Developing Supervisors
- ☑ Connect People to Each Other and the Mission

SENIOR MANAGEMENT COUNCIL

☑ propose challenges

that invite NASA community to solve small and large problems.

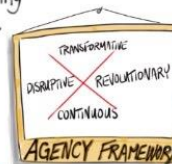
☑ Celebrate examples

of innovation in Program and Project teams.

☑ provide opportunities

for more employees to present innovative ideas and seek support to implement them.

☑ encourage Program and Project teams to use innovation as a tool

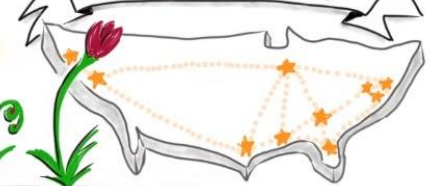


INNOVATION WORKSHOP
AUGUST 2015



LEAN FORWARD
FAIL SMART

INNOVATION DAY
NOVEMBER 1, 2016



2011

2012

2013

2014

2015

2016